

Research Note

**Larval *Ascarops* sp. (Nematoda: Spirurida) in
Introduced Mediterranean Geckos, *Hemidactylus turcicus*
(Sauria: Gekkonidae), from Texas**

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ABSTRACT: Third-stage larval spirurid nematodes, *Ascarops* sp., were found encysted in the stomach, pancreas, small intestine, and liver of 9 of 98 (9%) Mediterranean geckos, *Hemidactylus turcicus*, from Houston, Harris County, Texas. Histopathological effects of the parasite on tissues of *H. turcicus* were studied. The Mediterranean gecko represents a new host and the third saurian species reported to be infected by this nematode.

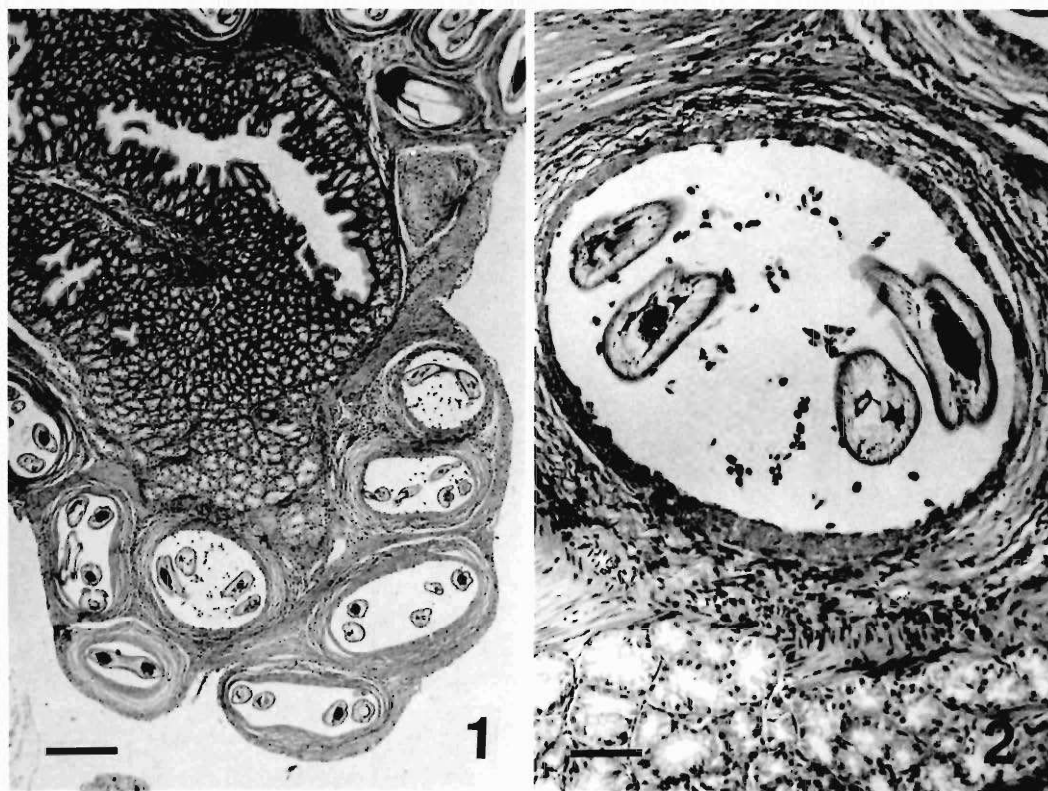
KEY WORDS: *Ascarops* sp., Gekkonidae, *Hemidactylus turcicus*, histopathology, Mediterranean gecko, Nematoda, prevalence, Spirurida, Texas.

The Mediterranean gecko, *Hemidactylus turcicus* (Linnaeus, 1758), is a small, mostly nocturnal, Old World lizard that ranges from western India and Somalia, west along the coastal regions of the Mediterranean basin to Spain, Morocco, and the Canary Islands (Conant and Collins, 1991). This gecko was inadvertently introduced into the New World around the turn of the century and is now well established at numerous localities around the Gulf Coast of the United States from Florida west to southern California and south into Mexico, Hispaniola, Cuba, and Panama (McCoy, 1970; Conant and Collins, 1991). A moderate amount of information is available on parasites of natural (McMillan, 1965; Tinar, 1982; Groschaft and Moravec, 1983; Paperna, 1989; Paperna and Landsberg, 1989a, b) and introduced populations of *H. turcicus* (Baruš and Coy Otero, 1974; Coy Otero and Baruš, 1979; McAllister et al., 1988; Pence and Selcer, 1988; Riley et al., 1988; Upton et al., 1988; McAllister et al., 1990). This note reports, for the first time, the occurrence of a larval spirurid in *H. turcicus* and provides prevalence data and a description

of the cysts associated with the infection in this host.

Between December 1986 and March 1989, 98 (50 males, mean \pm SE snout-vent length [SVL] = 46.3 ± 1.4 , range 28–58 mm; 48 females, 47.0 ± 1.2 , range 32–56 mm) hatchling, juvenile, and adult *H. turcicus* were collected by hand from within the reptile and amphibian facility of the Houston Zoological Gardens, Harris County, Texas ($N = 57$), Dallas Zoo, Dallas County, Texas ($N = 12$), on the walls of St. Anne's Catholic Church in Houston ($N = 22$), and at a private residence in Houma, Terrabonne Parish, Louisiana ($N = 7$). Geckos were killed within 48 hr with an overdose of sodium pentobarbital and examined for tissue-dwelling nematodes. Some encysted nematodes were fixed in situ in alcohol-formalin-acetic acid, sectioned at 7 μ m, and stained with Harris' hematoxylin and eosin counterstain. Some nematodes were teased from infected tissues, transferred to 70% ethanol, and cleared in glycerol for examination as temporary mounts. Voucher specimens of *H. turcicus* are deposited in the Arkansas State University Museum of Zoology (ASUMZ 6329–6334, 6392–6402, 6442–6465, 8649–8665, 8667–8673, 8535–8541). Voucher specimens of *Ascarops* sp. are on deposit in the U.S. National Parasite Collection, USDA, Beltsville, Maryland 20705, as USNM Helm. Coll. No. 82673.

Nine of 98 (9%) of the *H. turcicus* harbored third-stage larval *Ascarops* sp. within cysts in the stomach, pancreas, small intestine, and liver. One infected adult male gecko (54 mm SVL) came from the Houston Zoo while 2 adults and 1 ju-



Figures 1, 2. *Ascarops* sp. larvae within gastric cysts in the Mediterranean gecko, *Hemidactylus turcicus*. Scale bar 1 = 250 μ m; 2 = 70 μ m.

venile male (49.3 ± 3.3 , range 43–54 mm) and 5 adult females (53.0 ± 1.4 , range 48–56 mm) were collected at the St. Anne's locality in Houston. Only 1 of 27 (4%) of the immature versus 8 of 71 (11%) of the adult *H. turcicus* were infected.

In the stomach, thick-walled cysts were located in the submucosa and the layers of the muscularis externa. They were round to oblong in shape and approximated 420 μ m in diameter. There was distortion and displacement of the muscle layers (Fig. 1), giving a nodular appearance to the serosa. A few mononuclear inflammatory cells were scattered in the centers of the cystic spaces. The inner walls were composed of a hyaline-like matrix, whereas the middle portion was composed of thick concentric layers of laminated collagenous connective tissue (Fig. 2). The outermost connective tissue layers contained only a small inflammatory response consisting of occasional clusters of mononuclear cells (macrophages).

In the liver, the parasitic cysts were larger and approximated 800 μ m in diameter. Their structure was similar to those noted in the stomach

and caused a mild compression of the surrounding liver tissue. No inflammatory response was elicited. *Ascarops* sp. cysts were also present in the pancreas, where they caused minimal compression of the pancreatic acini and in the small intestine where they occurred in the muscularis externa.

Each granuloma contained a third-stage *Ascarops* sp. larva. Larvae were approximately 2.2 mm long and 85 μ m wide. The distinguishing differential features of a third-stage larva of *Ascarops* sp. are (1) the right and left anterolateral body walls are prolonged into dorsoventral lip-like projections and (2) the tip of the tail possesses a smooth knoblike process (see Goldberg and Bursey, 1988). Alicata (1935) reported that the only difference between larval *Ascarops* and similar third-stage larvae of *Physocephalus sexalatus* (Molin, 1860) Diesing, 1861, is that the latter has a tail knob with several digitiform processes. Only smooth knobs were observed in our specimens, and fourth-stage larvae or adult nematodes were not found.

The gastric *Ascarops* sp. cysts in *H. turcicus*

were somewhat similar to those seen in the stomach of the sagebrush lizard, *Sceloporus graciosus*, by Goldberg and Bursey (1989). However, the cysts were more numerous and disseminated in *H. turcicus* than in *S. graciosus*. Minimal granulomatous host response was evident in both of these lizards. Goldberg and Bursey (1988) examined granulomas containing larval *Ascarops* sp. in the liver of the western fence lizard, *S. occidentalis*. These granulomas were smaller (approximately 330 μ m in diameter) than those seen in *H. turcicus*. There was a much more mature granulomatous response to this parasite in *S. occidentalis*, including giant cells and epithelioid macrophages.

The life history of *Ascarops strongylina* (Rudolphi, 1819) Alicata and McIntosh, 1933, was first elucidated by Seurat (1915). Third-stage larvae have been recovered previously from 2 species of mammals, 4 species of birds, and 2 species of lizards (Goldberg and Bursey, 1989). Definitive hosts are mammals of the orders Artiodactyla, Lagomorpha, and Rodentia; first intermediate hosts include insects of the orders Coleoptera and Odonata (Alicata, 1935). About 20 species from 14 genera of beetles have been identified as intermediate hosts of nematodes in the genus *Ascarops* (Goldberg and Bursey, 1989). However, the specific insect host of *Ascarops* sp. ingested by *H. turcicus* has not yet been determined.

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